In the Claims

1. (Original) A plasma processing apparatus, comprising:

an evacuated chamber for containing a plasma,

a radio frequency source for exciting said plasma using radio frequency energy, and

a re-entrant vessel positioned within the chamber to shape and make more uniform said plasma contained within the chamber,

wherein the re-entrant vessel is movable within the chamber in at least a first direction to adjust the plasma uniformity, and the re-entrant vessel includes extensions of adjustable shape or position, which may be altered to further adjust and unify said plasma within said chamber.

2. (Currently amended) [[A plasma processing apparatus]] An ion source for bombarding a substrate, comprising

an evacuated chamber for containing a plasma,

an optical grid within the chamber having a plurality of apertures, ions from the plasma passing through said apertures of said optical grid to bombard said substrate,

a radio frequency source for exciting said plasma using radio frequency energy,

a re-entrant vessel, positioned within the chamber to shape and make more uniform said plasma contained within the chamber, and

one or more magnets, positioned within the re-entrant vessel.

3. (original) The apparatus of claim 2, further comprising an actuator for moving said magnets.

4. (original) The apparatus of claim 1, further comprising a radio frequency emitting coil within said re-entrant vessel.

5. (original) The apparatus of claim 1 or 2 wherein said re-entrant vessel is not evacuated.

6. - 9. (canceled)

10. (New) An ion source for bombarding a substrate, comprising:

an evacuated chamber for containing a plasma,

an optical grid within the chamber having a plurality of apertures, ions from the plasma passing through said apertures of said optical grid,

a radio frequency source for exciting said plasma using radio frequency energy, and

a re-entrant vessel positioned within the chamber to shape and make more uniform said plasma contained within the chamber.

11. (New) The ion source of claim 10 wherein the re-entrant vessel is movable within the chamber in at least a first direction to adjust the plasma uniformity.

12. (New) The ion source of claim 10 wherein the re-entrant vessel includes extensions of adjustable shape or position, which may be altered to further adjust and unify said plasma within said chamber.

13. (New) The ion source of claim 10 further comprising one or more magnets, positioned within the re-entrant vessel.

14. (New) The ion source of claim 13 further comprising an actuator for moving said magnets.

15. (New) The ion source of claim 10 further comprising a radio frequency emitting coil within said re-entrant vessel.

16. (New) The ion source of claim 10 wherein said re-entrant vessel is not evacuated.

17. (New) The ion source of claim 1 further comprising an optical grid within the chamber having a plurality of apertures. ions from the plasma passing through said apertures of said optical grid.